

Suisun Marshes, 3) Sonoma Marshes, Petaluma Marshes and Highway 37 marshes west of Sonoma Creek.

- Coordinate protection, enhancement, and restoration of saltmarsh and associated habitats with other federal, state, and regional programs (e.g., the San Francisco Bay Area Wetlands Ecosystem Goals Project, and USFWS species recovery plans) that could affect management of current and historic habitat use areas to avoid potential conflicts among management objectives and identify opportunities for achieving multiple management objectives.
- Initial species recovery efforts should be directed to locations where there are immediate opportunities for protection, enhancement, or restoration of suitable habitat.
- To the extent practicable, direct ERP salt marsh enhancement efforts towards existing degraded marshes that are of sufficient size and configuration to develop fourth order tidal channels (marshes would likely need to be at least 1,000 acres in size).
- Restore wetland and perennial grassland habitats adjacent to occupied habitats to create a buffer of natural habitat to protect populations from adverse affects that could be associated with future changes in land use on nearby lands and to provide habitat suitable for the natural expansion of populations.
- To the extent practicable, design salt marsh enhancements and restorations to provide low-angle upland slopes at the upper edge of marshes to provide for the establishment of suitable and sufficient wetland to upland transition habitat. Transition habitat zones should be at least 0.25 mile in width.
- Manage enhanced and restored habitat areas to avoid or minimize impacts on the Suisun ornate shrew associated with recreational uses on lands acquired or managed under conservation easements.
- Direct salt marsh habitat enhancements and restorations towards increasing habitat connectivity among existing and restored tidal

marshes within the range of the Suisun ornate shrew.

- To the extent practicable, design dikes constructed in enhanced and restored saline emergent wetlands to provide optimal wetland to upland transitional habitat.
- Identify and implement feasible methods for controlling invasive non-native marsh plants.
- Provide interim management of occupied saltmarshes to maintain source populations until restored habitats have developed sufficiently to provide suitable habitat.
- Provide interim management of occupied salt marshes to maintain source populations until restored habitats have developed sufficiently to provide suitable habitat.
- Acquire conservation easements to adjust grazing regimes to enhance wetland to upland transition habitat conditions in occupied habitat areas.
- Conduct research to determine use of restored salt marsh habitats by Suisun ornate shrews and the rate at which restored habitats are colonized.

REFERENCES

- Multi-Species Conservation Strategy. 2000. CALFED Bay-Delta Program, Programmatic EIS/EIR Technical Appendix. July 2000.
- Strategic Plan for Ecosystem Restoration. 2000. CALFED Bay-Delta Program, Programmatic EIS/EIR Technical Appendix. July 2000.

◆ SUISUN SONG SPARROW

INTRODUCTION

Suisun song sparrows live only in and around the Suisun Marsh and Bay. The Suisun song sparrow is associated with saline emergent wetlands. The population and distribution of this species have declined substantially primarily as a result of reclamation of tidal saltmarshes. The loss of habitat and declining condition of this species' population have warranted its inclusion as a species of special concern. Major factors that limit this resource's contribution to the health of the Delta are related to adverse effects of historical and current loss or degradation of tidal saltmarshes for agricultural, industrial, and urban uses and excessive predation on nests and individuals by non-native predators.

RESOURCE DESCRIPTION

Historically, much of the Suisun Marsh was a brackish tidal marsh. The Suisun song sparrow inhabited areas with suitable brackish marsh vegetation. The total area of historical tidal marsh habitat is estimated to have been about 66,600-73,700 acres. Between 70,000 and 77,000 pairs of Suisun song sparrows are estimated to have used the available marsh habitat annually. Recent estimates indicate that fewer than 6,000 pairs remain in 13 isolated populations, representing 8% of the species' former abundance. The remaining 13 populations number from about 1,300 pairs to about 20 pairs.

Since artificial levees were constructed beginning in the late 1800s, the managed marsh areas on the nontidal side of the levees are flooded seasonally and then drained or allowed to dry. These areas are consistently avoided by Suisun song sparrows. The birds require appropriate vegetation for nesting sites, song perches, and foraging cover. The vegetation must also produce seeds or harbor invertebrates that the birds pick up from the surface of mudflats. Each sparrow's territory must contain permanent water or moisture in the form of tidal ebb and flow. Typically, each territory contains at least one patch of tall, hard-stemmed bulrush that stands above the surrounding vegetation and is used as a singing perch. The birds apparently need these high song perches to establish territory, and the absence of song perches may be a limiting factor in the distribution of pairs.

The Suisun song sparrow is physiologically and behaviorally adapted to this area's naturally occurring brackish tidal conditions. It can drink brackish water and breeds earlier than upland subspecies. Early breeding avoids nest flooding during the highest spring tides. The Suisun song sparrow forages for invertebrates and seeds directly on the surface of mudflats.

The primary threat to the continued existence of the Suisun song sparrow is the continuing loss of habitat and severe fragmentation of brackish tidal marsh habitat in and around Suisun Marsh. The once-vast marsh has been reduced to small areas that are separated by barriers or connected only by narrow strips of vegetation along the banks of tidal sloughs. Interbreeding between populations in these areas is rare. As the southern shore of Suisun Marsh in Contra Costa County becomes increasingly industrialized and developed, habitat will continue to be degraded and, ultimately, the southern population may no longer be viable. Egg and nestling mortality is about 50% in the first 3 weeks after eggs are laid. The primary causes of this mortality are predation on eggs and nestlings by the introduced Norway rat, predation on nestlings by feral house cats, and flooding of nests during periods of high tides. Maintenance of levees, dikes, and other structures during the breeding period may also create sufficient disturbance to cause nesting failure. Levees constructed in the sparrow's habitat are high enough above the surrounding marsh to allow the growth of upland plants that require fresh water. Although Suisun song sparrow territories may include these areas, the species avoids centering its territory in this type of vegetation.

Long-term changes in the salinity gradient of the Bay-Delta may also have an effect on the species' distribution and abundance. The normal brackish condition of Suisun Marsh is directly attributable to the amount of freshwater outflow it receives from the Delta. This fresh water mixes with saltwater transported on incoming tides through Carquinez Strait. The amount of freshwater outflow has been reduced since historical times during water-years that are now considered normal. Suisun song sparrows can withstand short-term alterations in brackish conditions because they can subsist on pure saltwater

for several days. The vegetation they occupy in the brackish marsh is similarly adapted. If the water regime changes drastically or for long periods, however, a large-scale change in habitat could result. If salinity decreases, the Suisun song sparrow could face lowered reproductive rates, increased competition, and loss of genetic integrity as a result of breeding with invading upland subspecies that consume fresh water. If the water becomes too salty, saltwater marsh vegetation could displace brackish vegetation; saltwater marsh is not suitable habitat for the species, which is not adapted to consume saltwater for extended periods.



VISION

The vision for the Suisun song sparrow is to recover this California species of special concern in Suisun Marsh and the western Delta and contribute to the overall species richness and diversity. Achieving this vision will reduce conflict between protection for this species and other beneficial uses of land and water in the Bay-Delta.

Protecting and restoring existing and additional suitable tidal saline and fresh emergent wetlands (including brackish marshes) and reducing breeding stressors will be critical to the recovery of the Suisun song sparrow.

Restoration of tidal emergent wetlands in the Suisun Marsh/North San Francisco Bay Ecological Management Zone will help to recover this species by increasing its habitat area. Restoring associated higher elevation uplands would provide escape cover during high tides and flooding. Restoring these habitats would allow the population to increase at existing protected habitat areas and would ensure long-term survival. The restoration of high-quality sparrow habitat would also reduce the adverse effects of predation by non-native species by creating habitat conditions that are more favorable for sparrows and less favorable for predators.

The potential adverse effects of disturbance on breeding success could be reduced by encouraging agencies, organizations, and private landowners, through cooperative agreements and incentive programs, to conduct infrastructure maintenance activities in occupied habitat areas so that tidal brackish marsh vegetation is disturbed as little as possible and adults are not disturbed during the

breeding season. The possibility of managing breeding of the species to increase its reproductive success should be investigated (e.g., transferring eggs and/or young between nearby isolated populations to increase genetic interchange between populations). If the species responds favorably to such manipulations, the period for its recovery would be reduced.

INTEGRATION WITH OTHER RESTORATION PROGRAMS

Programs and projects designed to protect, restore, and enhance the Suisun Marsh/North San Francisco Bay Ecological Management Zone to provide direct or incidental benefits to the Suisun song sparrow include:

- San Francisco Estuary Project,
- San Francisco Bay Area Wetlands Ecosystem Goals Project.
- Cache Creek Corridor Restoration Plan,
- California Wetland Riparian Geographic Information System Project,
- Governor's California Wetland Conservation Policy,
- Tidal Wetlands Species Recovery Plan,
- Wetlands Reserve Program,
- Inland Wetlands Conservation Program,
- Montezuma Wetlands Project, and
- National Estuarine Reserve Research System.

LINKAGE WITH OTHER ECOSYSTEM ELEMENTS

Restoration of the Suisun Song Sparrow is integrally linked with restoring tidal permanent emergent wetlands in Suisun Bay and Marsh and the western Delta. Restoration of adjacent tidal perennial aquatic habitat, particularly mudflats, is also important.

OBJECTIVE, TARGET, ACTIONS, AND MEASURES



The Strategic Objective is to achieve, first, recovery and then large self-sustaining populations of at-risk native species dependent on the Delta, Suisun Bay, and Suisun Marsh.

SPECIES TARGET: Maintain the current distribution and existing populations of the Suisun song sparrow and reestablish and maintain viable species' populations throughout its historic range in the portion of the Delta and Bay Regions within the ERP focus area.

LONG-TERM OBJECTIVE: Restore populations of Suisun song sparrow to habitats throughout its native range by creating/restoring enough brackish tidal marsh habitat to support 40,000 nesting pairs.

SHORT-TERM OBJECTIVE: With existing populations, find ways to connect fragmented brackish and freshwater habitats to increase the gene flow among population segments and reduce the likelihood of extirpation of isolated population segments.

RATIONALE: The Suisun song sparrow occurs only in and near Suisun Marsh, in about 13 isolated populations. Populations of this unusual subspecies are declining for a variety of reasons but mainly the degradation of their habitat. Reductions in fresh water outflow from the Sacramento-San Joaquin Rivers and diking and channelization of marsh lands have contributed to their decline. Restoration of their populations is likely to be a good indicator of the success of restoration of brackish tidal marshes in the Suisun Marsh area.

STAGE 1 EXPECTATIONS: All Suisun song sparrow populations will have been identified and protected from further development and habitat alterations; plans will have been developed and implemented to connect isolated populations by means of habitat restoration projects.

RESTORATION ACTIONS

The following general targets will assist in meeting the implementation objective:

- Increase the total number of pairs.
- Increase the number of pairs in each of the 13 isolated populations.
- Increase the number of populations.
- Reduce the extent of isolation among the populations.

The following general programmatic actions will assist in meeting the targets:

- Increase the amount of tidal brackish water marshes in Suisun Bay and Marsh and in the western Delta.
- Decrease the extent of isolation of remaining tidal marshes in Suisun Bay and Marsh and the western Delta.
- Increase the amount of grassland habitat adjacent to tidal marshes in Suisun Bay and Marsh and the western Delta.
- Within existing and restored marshes ensure presence of tall, hard-stemmed bulrush stands.
- Increase the area of tidal mudflats in close proximity to existing and restored marshes.

MSCS CONSERVATION MEASURES

The following conservation measures were included in the Multi-Species Conservation Strategy (2000) to provide additional detail to ERP actions that would help achieve Suisun song sparrow habitat or population targets. The intent of these conservation measures is to reduce the risk of current and imminent threats to maintaining the current distribution and existing populations of the Suisun song sparrow and reestablish and maintain viable species' populations throughout its historic range in the portion of the Bay Region within the ERP focus area and the Delta Region.

- The geographic priorities for implementing ERP actions to protect, enhance, and restore saline emergent wetlands and associated habitats for

the Suisun song sparrow should be: 1) western Suisun Marsh, 2) eastern Suisun Marsh, and 3) the Contra Costa County shoreline.

- Coordinate protection, enhancement, and restoration of saltmarsh and associated habitats with other federal, state, and regional programs (e.g., the San Francisco Bay Area Wetlands Ecosystem Goals Project, and USFWS species recovery plans) that could affect management of current and historic habitat use areas to avoid potential conflicts among management objectives and identify opportunities for achieving multiple management objectives.
- Restore wetland and perennial grassland habitats adjacent to occupied nesting habitats to create a buffer of natural habitat to protect nesting pairs from potential adverse affects that could be associated with future changes in land use on nearby lands and to provide suitable foraging habitat and nesting habitat area suitable for the natural expansion of populations.
- Initial species recovery efforts should be directed to locations where there are immediate opportunities for protection, enhancement, or restoration of suitable habitat.
- To the extent practicable, design dikes constructed in enhanced and restored saline emergent wetlands to provide optimal wetland to upland transitional habitat.
- To the extent practicable, direct ERP salt marsh enhancement efforts towards existing degraded marshes that are of sufficient size and configuration that are large enough to develop fourth order tidal channels (marshes would likely need to be at least 1,000 acres in size).
- Design salt marsh enhancements and restorations to provide low-angle upland slopes at the upper edge of marshes to provide for the establishment of suitable and sufficient wetland to upland transition habitat. To the extent feasible, transition habitat zones should be at least 0.25 mile in width.
- Control non-native plants in existing salt marshes where non-native plants have degraded habitat quality and in salt marshes restored under the ERP.

- Manage enhanced and restored habitat areas to avoid or minimize potential impacts associated with recreational uses on lands acquired or managed under conservation easements on the Suisun song sparrow.
- Direct salt marsh habitat enhancements and restorations towards increasing habitat connectivity among existing occupied and restored tidal marshes.
- To the extent practicable, direct ERP restorations to improve tidal circulation to diked wetlands that currently sustain partial tidal exchange.
- To the extent practicable, control non-native predator populations in occupied habitat areas and salt marshes enhanced and restored under the ERP.
- Identify and implement feasible methods for controlling invasive non-native marsh plants.
- Conduct research to determine use of restored salt marsh habitats by Suisun song sparrows and the rate at which restored habitats are colonized.
- Acquire conservation easements to adjust grazing regimes to enhance wetland to upland transition habitat conditions.

REFERENCES

- Multi-Species Conservation Strategy. 2000. CALFED Bay-Delta Program, Programmatic EIS/EIR Technical Appendix. July 2000.
- Strategic Plan for Ecosystem Restoration. 2000. CALFED Bay-Delta Program, Programmatic EIS/EIR Technical Appendix. July 2000.

◆ SAN PABLO SONG SPARROW

INTRODUCTION

San Pablo song sparrows live only in and around the North San Francisco Bay. The San Pablo song sparrow is associated with saline emergent wetlands. The population and distribution of this species have declined substantially primarily as a result of reclamation of tidal saltmarshes. The loss of habitat and declining condition of this species' population have warranted its inclusion as a species of special concern by the California Department of Fish and Game.

RESOURCE DESCRIPTION

The current range of the San Pablo song sparrow is reduced from its historical range. It was once widespread from Richardson Bay to San Rafael Bay; now only occurring in extreme western Richardson Bay, along Madera Creek, and along the southern end of San Rafael Creek. In the northern portion of San Pablo Bay, this sparrow also occurs in the marshes of Petaluma, Sonoma, and Napa rivers. In the southern portion of the bay, the San Pablo song sparrow occurs at Wilson Point and Pinole Point, and at the mouths of San Pablo Creek and Wildcat Creek (Jurek 1974).

The San Pablo song sparrow inhabits the tidal flats of San Pablo Bay. This sparrow is often associated with *grindelia* bushes, which it utilizes for nesting sites, song posts, and refuge from high tides. Nests are often built in a singular linear row in shrubs high enough to escape high tides (Walton 1975). This sparrow forages for seeds and insects on mudflats, at the water's edge, and under shrubs (Grinnell and Miller 1944).



VISION

The vision for the San Pablo song sparrow is to recover this California species of special concern in the North Bay and contribute to the overall species richness and diversity.

Protecting and restoring existing and additional suitable tidal saline and fresh emergent wetlands (including brackish marshes) and reducing breeding

stressors will be critical to the recovery of the San Pablo song sparrow.

Restoration of tidal emergent wetlands in the Suisun Marsh/North San Francisco Bay Ecological Management Zone will help to recover this species by increasing its habitat area. Restoring associated higher elevation uplands would provide escape cover during high tides and flooding. Restoring these habitats would allow the population to increase at existing protected habitat areas and would ensure long-term survival. The restoration of high-quality sparrow habitat would also reduce the adverse effects of predation by non-native species by creating habitat conditions that are more favorable for sparrows and less favorable for predators.

The potential adverse effects of disturbance on breeding success could be reduced by encouraging agencies, organizations, and private landowners, through cooperative agreements and incentive programs, to conduct infrastructure maintenance activities in occupied habitat areas so that tidal brackish marsh vegetation is disturbed as little as possible and adults are not disturbed during the breeding season. The possibility of managing breeding of the species to increase its reproductive success should be investigated (e.g., transferring eggs and/or young between nearby isolated populations to increase genetic interchange between populations). If the species responds favorably to such manipulations, the period for its recovery would be reduced.

INTEGRATION WITH OTHER RESTORATION PROGRAMS

Programs and projects designed to protect, restore, and enhance the Suisun Marsh/North San Francisco Bay Ecological Management Zone to provide direct or incidental benefits to the San Pablo song sparrow include:

- San Francisco Estuary Project,
- San Francisco Bay Area Wetlands Ecosystem Goals Project.
- California Wetland Riparian Geographic Information System Project,

- Governor's California Wetland Conservation Policy,
- Tidal Wetlands Species Recovery Plan,
- Wetlands Reserve Program,
- Inland Wetlands Conservation Program,
- National Estuarine Reserve Research System.

LINKAGE WITH OTHER ECOSYSTEM ELEMENTS

Restoration of the San Pablo Song Sparrow is integrally linked with restoring tidal permanent emergent wetlands in the North Bay. Restoration of adjacent tidal perennial aquatic habitat, particularly mudflats, is also important.

OBJECTIVE, TARGET, ACTIONS, AND MEASURES



The Strategic Objective is to achieve, first, recovery and then large self-sustaining populations of at-risk native species dependent on the Delta, Suisun Bay, and Suisun Marsh.

SPECIES TARGET: Maintain the current distribution and existing populations of the San Pablo song sparrow and reestablish and maintain viable species' populations throughout its historic range in the portion of the Bay Region within the ERP focus area.

LONG-TERM OBJECTIVE: Reduce the risk of current and imminent threats to maintaining the current distribution and existing populations of the San Pablo song sparrow and reestablish and maintain viable species' populations throughout its historic range in the portion of the Bay Region within the ERP focus area.

SHORT-TERM OBJECTIVE: With existing populations, find ways to connect fragmented brackish and freshwater habitats to increase the gene flow among population segments and reduce the likelihood of extirpation of isolated population segments.

RATIONALE: Populations of this unusual subspecies are declining for a variety of reasons but mainly the degradation of their habitat. Reductions in fresh water outflow from the Sacramento-San Joaquin Rivers and diking and channelization of marsh lands have contributed to their decline. Restoration of their populations is likely to be a good indicator of the success of restoration of brackish tidal marshes in the North Bay Region.

STAGE 1 EXPECTATIONS: All San Pablo song sparrow populations will have been identified and protected from further development and habitat alterations; plans will have been developed and implemented to connect isolated populations by means of habitat restoration projects.

RESTORATION ACTIONS

The following general targets will assist in meeting the implementation objective:

- Increase the total number of pairs.
- Increase the number of populations.
- Reduce the extent of isolation among the populations.

The following general programmatic actions will assist in the recovery of the San Pablo song sparrow:

- Increase the amount of tidal brackish water marshes in the North Bay Region.
- Decrease the extent of isolation of remaining tidal marshes in the North Bay Region.
- Increase the amount of grassland habitat adjacent to tidal marshes in the North Bay Region.
- Within existing and restored marshes ensure presence of tall, hard-stemmed bulrush stands.
- Increase the area of tidal mudflats in close proximity to existing and restored marshes.

MSCS CONSERVATION MEASURES

The following conservation measures were included in the Multi-Species Conservation Strategy (2000) to provide additional detail to ERP actions that would help achieve San Pablo song sparrow habitat or

population targets. The intent of these conservation measures is to reduce the risk of current and imminent threats to maintaining the current distribution and existing populations of the San Pablo song sparrow and reestablish and maintain viable species' populations throughout its historic range in the portion of the Bay Region within the ERP focus area and the Delta Region.

- The geographic priorities for implementing ERP actions to protect, enhance, and restore saline emergent wetlands and associated habitats for the San Pablo song sparrow should be: 1) Gallinas/Ignacio marshes and Napa Marshes, 2) Sonoma Marshes, Petaluma Marshes, and Highway 37 marshes west of Sonoma Creek, 3) Point Pinole Marshes, 4) Highway 37 marshes east of Sonoma Creek,
- Coordinate protection, enhancement, and restoration of saltmarsh and associated habitats with other federal, state, and regional programs (e.g., the San Francisco Bay Area Wetlands Ecosystem Goals Project, and USFWS species recovery plans) that could affect management of current and historic habitat use areas to avoid potential conflicts among management objectives and identify opportunities for achieving multiple management objectives.
- Restore wetland and perennial grassland habitats adjacent to occupied nesting habitats to create a buffer of natural habitat to protect nesting pairs from adverse affects that could be associated with future changes in land use on nearby lands and to provide suitable foraging habitat and nesting habitat area suitable for the natural expansion of populations.
- Initial species recovery efforts should be directed to locations where there are immediate opportunities for protection, enhancement, or restoration of suitable habitat.
- Design dikes constructed in enhanced and restored saline emergent wetlands to provide optimal wetland to upland transitional habitat.
- To the extent practicable, direct ERP salt marsh enhancement efforts towards existing degraded marshes that are of sufficient size and configuration to develop fourth order tidal

channels (marshes would likely need to be at least 1,000 acres in size).

- To the extent practicable design salt marsh enhancements and restorations to provide low-angle upland slopes at the upper edge of marshes to provide for the establishment of suitable and sufficient wetland to upland transition habitat. Transition habitat zones should be at least 0.25 mile in width.
- Manage enhanced and restored habitat areas to avoid or minimize impacts on the San Pablo song sparrow associated with recreational uses on lands acquired or managed under conservation easements.
- To the extent practicable, control non-native predator populations in occupied habitat areas and salt marshes enhanced and restored under the ERP.
- Identify and implement feasible methods for controlling invasive non-native marsh plants.
- Conduct research to determine use of restored salt marsh habitats by San Pablo song sparrows and the rate at which restored habitats are colonized.

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◆ SPECIES DESIGNATED FOR CONTRIBUTE TO RECOVERY

INTRODUCTION

The Strategic Plan for Ecosystem Restoration presents 6 goals to guide the implementation of restoration actions during the 20-30 year program.

The first Strategic Goal focuses on at-risk species:

This section addresses those species designated as "Contribute to Recovery" in the MSCS and ERP.

STRATEGIC GOAL 1: Achieve, first, recovery and then large self-sustaining populations of at-risk native species dependent on the Delta and Suisun Bay; support similar recovery of at-risk native species in the Bay-Delta estuary and its watershed; and minimize the need for future endangered species listings by reversing downward population trends of native species that are not listed.

CONTRIBUTE TO RECOVERY DESIGNATION

CONTRIBUTE TO RECOVERY ("r"): For species designated "r," CALFED will make specific contributions toward the recovery of the species. The goal "contribute to recovery" was assigned to species for which CALFED Program actions affect only a limited portion of the species range and/or CALFED Program actions have limited effects on the species.

To achieve the goal of contributing to a species' recovery, CALFED is expected to undertake some of the actions under its control and within its scope that are necessary to recover the species. When a species has a recovery plan, CALFED may implement some of the measures identified in the plan, that are within the CALFED Problem Area, and some measures that are outside the Problem Area. For species without a recovery plan, CALFED would need to implement specific measures that would benefit the species.

The "contribute to recovery" species addressed in this section include:

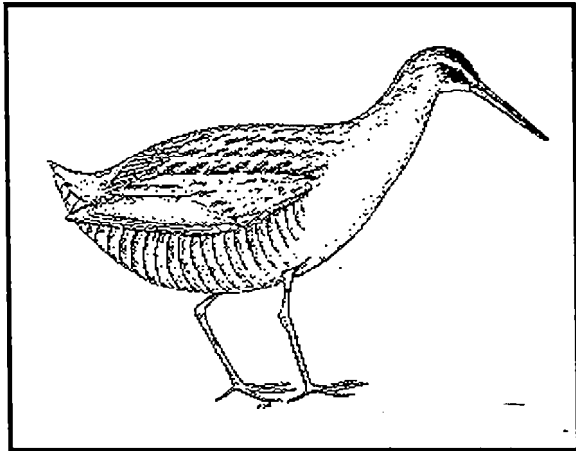
- California clapper rail
- California black rail
- Swainson's hawk
- salt marsh harvest mouse
- San Pablo California vole
- riparian brush rabbit
- San Joaquin Valley woodrat
- Sacramento perch
- giant garter snake
- greater sandhill crane
- California yellow warbler
- little willow flycatcher
- western yellow-billed cuckoo
- least Bell's vireo
- saltmarsh common yellowthroat
- bank swallow
- Delta green ground beetle
- bristly sedge*
- delta tule pea*
- delta mudwort*
- alkali milk-vetch*
- Point Reyes bird's-beak*,
- delta coyote thistle*,
- alkali milk-vetch**, and
- Crampton's tuctoria**.

* Denotes species which were described previously in the vision for tidal brackish and freshwater marsh special-status plant species and inland dune special status plants.

** Denotes species which are described in the vision for vernal pools special-status plant species.

Note: the use of Species Targets in this section is synonymous with the Species Goal Prescriptions provided in the Multi-Species Conservation Strategy.

◆ CALIFORNIA CLAPPER RAIL



INTRODUCTION

The clapper rail is a year-long resident in coastal wetlands and brackish areas around San Francisco Bay. Within the Central Valley, this species is found only in the Suisun Marsh/North San Francisco Bay Ecological Management Zone. The California clapper rail is associated with saline emergent wetlands. The population and distribution of this species have declined substantially, primarily as a result of reclamation of its tidal saltmarsh habitats. The loss of habitat and declining condition of the species' population have warranted its listing as endangered under the State and federal Endangered Species Acts. This species characteristically inhabits the more saline marshes of the Bay. Highest population densities are associated with large tidal marsh areas with well-developed channel systems (Goals Project 1999).

Major factors that limit this resource's contribution to the health of the Delta are related to adverse effects of historical and current loss or degradation of tidal saltmarshes for agricultural, industrial, and urban uses, and excessive predation on nests and individuals by non-native predators.

RESOURCE DESCRIPTION

Habitat loss is largely a result of reclamation for agricultural, industrial, and urban uses and water management projects. Populations have also been limited due to loss or degradation of tidal saltmarshes for waterfowl hunting and management. The total

area of these remaining habitats represents only a small percentage of their historic level. The California clapper rail breeds from February through August. The preferred habitat is saline tidal marshes but are known to use brackish marsh areas with alkali bulrush. It builds a platform nest concealed by a canopy of cordgrasses and pickleweed. It may also use cattails and bulrushes in fresh emergent wetland habitats although these areas are not considered suitable foraging and breeding habitat. Adjacent upper wetland or upland habitat with aquatic vegetation are also important because they provide nesting and escape cover during high tides and floodwaters.

Significant loss of saline and brackish emergent wetland habitat and associated upland habitats and high marshes is the primary factor for the decline in this species' populations. These habitat losses have reduced populations sufficiently that predation by non-native species, such as the Norway rat, red fox, and feral cats; swamping of nests by boat wakes; and contaminants, such as selenium, are now also substantial factors affecting the ability of the species to recover.



VISION

The vision for the California clapper rail is to contribute to the recovery of this State- and federally listed endangered species to contribute to overall species richness and diversity.

Achieving this vision will reduce conflict between the need for its protection and other beneficial uses of land and water in the Bay-Delta.

Protecting existing and restoring additional suitable saline and brackish emergent wetlands and adjacent higher elevation habitats and reducing the effect of other factors that can suppress breeding success will be critical to the recovery of the California clapper rail. The Suisun Marsh and San Francisco Bay areas once comprised a mosaic of large contiguous blocks of tidal saline emergent wetland in association with adjacent upland habitats. Restoration of saline and brackish emergent wetland and associated upland